requires expensive processing. Glass based touch sensors, moreover, must be manufactured from individual substrates of cut glass. Such manufacture is costly and time-consuming. All of these deficiencies diminish the desirability of existing flexible touch sensors in some applications.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** is a schematic diagram showing a multi-touch screen and flexible display according to one embodiment of the present invention;

[0012] FIG. **2** is an illustration of the multi-touch screen together with a plurality of component according to the present invention;

[0013] FIG. **3** is an illustration of a top view of a transparent flexible multi-touch screen, according to one embodiment of the present invention;

[0014] FIG. **4** is an illustration of a top view of a transparent flexible multi-touch screen, according to one embodiment of the present invention;

[0015] FIG. **5** is an illustration of flexible multi-touch screen device, according to one embodiment of the present invention;

SUMMARY OF THE INVENTION

[0016] The invention is directed towards a touch panel with a flexible property comprising: a) A flexible layer; and b) One or more sensors configured to detect a plurality of simultaneous touching positions at distinct locations of the layer and to generate distinct signals representative of the locations for each of the touches. And a method for flexible touch panel comprising: a) Driving one or more sensors; and b) Detecting a plurality of simultaneous touching positions at distinct locations of a touch panel, wherein the touch panel comprising a flexible property.

[0017] The invention is also directed towards a flexible multi-touch screen device, comprising: a) A display as user interface; and b) A multi-touch panel with flexible property to combine with the display configured to detect a plurality of simultaneous touching positions at distinct locations of the multi-touch panel.

[0018] The present invention has the notable improvement of a thin, light, easily-manufactured device with a multi-touch screen comprising reduced weight, size, and cost. A more reliable, inexpensive, lightweight, flexible, transparent, durable, and easy-controlling touch sensor and an efficient, low-cost method of manufacturing are disclosed that can increase the malleability, endure attack, allow multi-touch and ensure improved sensitivity and resolution.

DETAILED DESCRIPTION OF THE INVENTION

[0019] The present invention is generally applicable to flexible touching systems and particularly to flexible touching panels where a plurality of touches may be applied by one or more users. The present invention is particularly suited to a touch system where some portion of a plurality of touch inputs may occur simultaneously or otherwise temporally overlap. One embodiment of the present invention may be suited for use in a electronic map designed to be used by one or more users at the same time where, in the course of using the map, users can apply touch input to generate a response in the map, and where a plurality of touches may start at the same time and/or end at the same time and/or overlap for at least part of the time during which each touch is applied. Such touch inputs can be referred to as overlapping touches, double touches, or simultaneous touches. After the use of the map, it can roll up to reduce the size.

[0020] In a touch screen panel, the position of a touch applied by a user is generally determined by measuring distinct signals generated by each touch input, and then comparing the signals or ratios of the signals to calculate the position of each touch. The location data can then be correlated to a particular action or instruction, for example. Measured signals include electrical current, electrical voltage, electromagnetic energy, light energy, wave energy, bending movement, acceleration, force per unit area, and the like. Assuming a properly calibrated touch panel, the calculated position of a touch should be sufficiently close to the actual location touched by the user so that the user's intended instruction can be carried out. The distance between the actual touch location and the corresponding reported touch location that is said to be sufficiently close is determined, in part, by the resolution of the touch system. A reported touch location that sufficiently closely corresponds to an actual location touched by a user is referred to as a valid touch.

[0021] Generally, a touch applied to a touch screen includes three steps, namely touch-down, hold, and lift-off. The signals that are measured to calculate the location of a touch is determined against a background level, which is the residual signal level presented when no touch is being applied. When a touch is applied the signal increases from its background value to a new value, referred to as the hold value, which is measurably different from the background level. The transition from background to a hold level is called touch-down. The applied touch is generally held for a finite time which is referred to as the hold time, corresponding to the hold step, during which the hold signal ideally remains relatively constant, or more practically, fluctuates within a range where all values are substantially larger than the background level. The hold time is generally long enough that a touch location may be measured. At the end of the hold time and as the user removes the applied touch, the value of the generated signal decreases from its hold value to a background level. This is referred to as lift-off.

[0022] Using a touch panel may limit or prohibit the use of the touch screen panel in certain applications, such as those applications where two or more simultaneous or overlapping touches may foreseeably, or even desirably, be applied by one or more users. For example, it may be desirable to employ touch screens in electronic map used by a plurality of users who use a single touch screen to input instructions at the same times. Even though each player may use a separate and predetermined section of the touch screen when using the map, in the course of using, many overlapping touch events may occur as each user touches his section of the touch screen.

[0023] The present invention provides flexible multi-touch panel which is configured to detect a plurality of simultaneous touching positions at distinct locations of it. A touch panel may utilize detecting techniques such as dispersive signal technology, resistive technology, capacitive technology, electromagnetic induction technology, surface wave technology, acoustic pulse recognition, strain gauge, optical technology or other technology suitable for touch panel.

[0024] One embodiment of the device includes a flexible touch screen that is operatively coupled to the controller. The flexible touch screen is a transparent panel that is positioned in front of the flexible display device, in the rear of the flexible display device, adjacent to the flexible display device or